

Application No. 10/678,408  
Amendment Dated May 24, 2005

**AMENDMENTS TO THE SPECIFICATION:**

**Please Amend Page 10, Paragraph 4 as follows:**

The amine may be a mono- or polyamine. The monoamines generally have at least one hydrocarbyl group containing 1 to about 24 carbon atoms, preferably with from 1 to about 12 carbon atoms. Examples of monoamines include fatty ( $C_{8-30}$ ) amines, primary ether amines (SURFAM® amines), tertiary-aliphatic primary amines ("Primene"), hydroxyamines (primary, secondary or tertiary alkanol amines), ether N-(hydroxyhydrocarbyl)amines, and hydroxyhydrocarbyl amines (Ethomeens" and "Propomeens"). The polyamines include alkoxylated diamines (Ethoduomeens), fatty diamines ("Duomeens"), alkylenepolyamines (ethylenepolyamines), hydroxy-containing polyamines, polyoxyalkylene polyamines (Jeffamines), condensed polyamines (a condensation reaction between at least one hydroxy compound with at least one polyamine reactant containing at least one primary or secondary

**Please Amend Page 13, Paragraph 1 as follows:**

A preferred type of aromatic amine antioxidant is an alkylated diphenylamine of the general formula:



wherein  $R^{23}$  is an alkyl group (preferably a branched alkyl group) having 8 to 12 carbon atoms, (more preferably 8 or 9 carbon atoms) and  $R^{24}$  is a hydrogen atom, alkylaryl or an alkyl group (preferably a branched alkyl group) having 8 to 12 carbon atoms, (more preferably 8 or 9 carbon atoms). Preferred compounds are available commercially as Naugalube® 438L, 640, and 680 manufactured by Crompton Corporation. Other commercially available aromatic amine antioxidants include Vanlube® SL, DND, NA, 81, 961 and 2005 sold by the R.T. Vanderbilt Company, Inc. Another useful type of antioxidant for preferred inclusion in the compositions of this invention is comprised of one or more liquid, partially sulfurized phenolic compounds such as are prepared by reacting sulfur monochloride with a liquid mixture of phenols—at least about 50 mass percent of which

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mixture of phenols is composed of one or more reactive, hindered phenols—in proportions to provide from about 0.3 to about 0.7 ~~gram-atoms~~ ~~gram molecules~~ of sulfur monochloride per mole of reactive, hindered phenol so as to produce a liquid product. Typical phenol mixtures useful in making such liquid product compositions include a mixture containing by mass about 75% of 2,6-di-tert-butylphenol, about 10% of 2-tert-butylphenol, about 13% of 2,4,6-tri-tertbutylphenol, and about 2% of 2,4-di-tertbutylphenol. The reaction is exothermic and thus is preferably kept within the range of about 15°C to about 70°C, most preferably between about 40°C to about 60°C.

Please Amend Page 26, Paragraph 1 as follows:

Laboratory tests were conducted by using a original Falex machine to simulate the valve train wear of an automobile engine. The V-blocks and pin were washed in mineral spirits with an ultrasonic cleaner, rinsed with acetone, air dried and weighed. The test sample (60 g) was placed into the oil cup. The motor was switched on and the loading arm was placed on the ratchet wheel. Upon reaching the reference load of 227 kg, the ratchet wheel was disengaged and the load was maintained constant for 3.5 hours. Thereafter, the motor was switched off. The V-blocks and pin were washed, dried and weighed. The mass loss, a measure of wear, was recorded and compiled below. For testing conditions, a FAIL is considered to be any test which did not run for 60 minutes, because of excessive wear or high torque, i.e. where the load could not be maintained. For FAIL tests, mass loss is not relevant, and therefore not shown.

Please amend Page 28, Paragraph 2 as follows:

A particular thiadiazole compound tested was butanedioic acid ((4,5-dihydro-5-thioxo-1,3,4-thiadiazol-2-yl) thio)-bis (2-ethylhexyl) ester, available as Vanlube® 871 from R.T. Vanderbilt Company, Inc. The results are set forth in Table 2 below. It can be clearly seen that while the thiadiazole compound alone (test 12) does not impart sufficient antiwear protection, excellent results are obtained when used in combination with the organo borate ester composition.